REMARKS

This Amendment is in response to the Office Action of November 18, 2002. In the Office Action, the Examiner rejected Claims 1-18 under 35 USC 112, first and second paragraphs. With this Amendment, Claims 1-18 are cancelled and new Claims 19-36 are added and presented for reconsideration and allowance.

Rejection under 35 USC 112

The Examiner considered use of various mathematical symbols as not meeting the requirements of 35 U.S.C. 112, first paragraph. The Examiner found parameters $\hat{A}$ and λ (controller zero value) to be not adequately described in the specification. The Examiner questioned applicant's meaning of "a controller zero."

"Controller zero" and λ

In the specification at page 6, lines 6-7, λ is defined to be a "controller zero." A person of ordinary skill in the art would know that a controller has mathematical roots known as poles and zeros. This can be seen, for example, by reference to Definition 4.6, pages 95-96 of Schaum's Outline - Feedback and Control Systems, Second Edition (McGraw-Hill 1990 ISBN 0-07-017052-5) which states:

4.11 COMPLEX PLANE: POLE-ZERO MAPS

The rational functions $F(s)$ for continuous systems can be rewritten as

$$F(s) = \frac{b_m \sum_{i=0}^{m} (b_i/b_m)s^i}{\sum_{i=0}^{n} a_i s^i} = \frac{b_m \prod_{i=1}^{m} (s+z_i)}{\prod_{i=0}^{n} (s+p_i)}$$

where the terms $s+z_i$ are factors of the numerator polynomial and the terms $s+p_i$ are factors of the denominator polynomial, with $a_n \equiv 1$. If s is replaced by z, $F(z)$ represents a system function for discrete-time systems.

Definition 4.6: Those values of the complex variable s for which $|F(s)|$ [absolute value of $F(s)$] is zero are called the **zeros** of $F(s)$.

Definition 4.7: Those values of the complex variable s for which $|F(s)|$ is infinite are called the poles of $F(s)$.

The definition of λ as "a controller zero" appears to be understandable by a person of ordinary skill in the art in view of Definition 4.6 above.

Adaptive parameter $\hat{A}$

In the specification at page 7, lines 10-17, it is disclosed that "...The ratio J/K_t is represented by "A"..." and that "...The value of A is unknown in practice and an adaptive parameter $\hat{A}$, which is an estimate of A, is used instead...". The variable "J" is disclosed to be the polar moment of inertia of a voice coil motor (page 7, lines 6-7) and the variable K_t is disclosed to be the torque constant of the voice coil motor. Examples of methods of calculating the adaptive parameter estimate $\hat{A}$ are disclosed at 307 in FIG. 6 and in Equations 30-32.

Definition of variables with "dot" notations

The Examiner found some variables (used in the presently cancelled claims), to be not adequately defined.

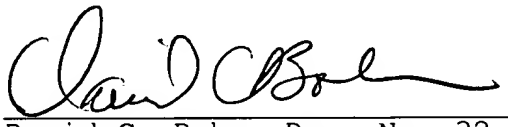
While these claims are now cancelled, applicant notes that, the specification at page 6, lines 2-5 discloses that "...one dot over a variable indicates a first derivative with respect to time "t", and two dots over a variable indicates a second derivative with respect to time "t" according to the usual mathematical conventions...". The variable symbols under the dots are also defined in the specification.

The newly presented claims 19-36 are believed to meet the requirements of 35 USC 112. New Claims 19-36 appear to be patentable over the references cited and favorable action is requested.

The Director is authorized to charge any fee deficiency required by this paper or credit any overpayment to Deposit Account No. 23-1123.

Respectfully submitted,

WESTMAN, CHAMPLIN & KELLY, P.A.

By: 

David C. Bohn, Reg. No. 32,015
Suite 1600 - International Centre
900 Second Avenue South
Minneapolis, Minnesota 55402-3319
Phone: (612) 334-3222 Fax: (612) 334-3312